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September 8, 2000

BOX PATENT APPLICATION  
Assistant Commissioner for Patents  
Washington, D.C. 20231

Re: Application of Hiroyasu KURAMATSU  
COMMUNICATION TERMINAL FOR DATA COMMUNICATIONS  
Our Ref. Q60150

Dear Sir:

Attached hereto is the application identified above including 47 sheets of the specification and claims, 10 sheets of informal drawings, the executed Assignment and PTO 1595 form, and the executed Declaration and Power of Attorney. Also enclosed is an Information Disclosure Statement with Form PTO-1449 and reference.

The Government filing fee is calculated as follows:

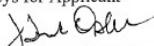
Total claims	34	-	20	=	14	x	\$18.00	=	\$252.00
Independent claims	9	-	3	=	6	x	\$78.00	=	\$468.00
Base Fee									\$690.00

<b>TOTAL FILING FEE</b>	<b>\$1410.00</b>
Recordation of Assignment	\$40.00
<b>TOTAL FEE</b>	<b>\$1450.00</b>

Checks for the statutory filing fee of \$1410.00 and Assignment recordation fee of \$40.00 are attached. You are also directed and authorized to charge or credit any difference or overpayment to Deposit Account No. 19-4880. The Commissioner is hereby authorized to charge any fees under 37 C.F.R. §§ 1.16 and 1.17 and any petitions for extension of time under 37 C.F.R. § 1.136 which may be required during the entire pendency of the application to Deposit Account No. 19-4880. A duplicate copy of this transmittal letter is attached.

Priority is claimed from September 21, 1999 based on Japanese Application No. 266947/99. The priority document is enclosed herewith.

Respectfully submitted,  
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COMMUNICATION TERMINAL FOR DATA COMMUNICATIONS

BACKGROUND OF THE INVENTION

1. Field of the Invention

The present invention relates to a communication terminal. In particular, it relates to a communication terminal suitable for a mobile telephone or a mobile information terminal which performs data communications.

2. Description of the Related Art

Communication terminals have rapidly become pervasive in today's society. The high functionality and miniaturization is achieved by the advancement of communication and packaging technologies. Conventional communication terminals include a mobile telephone in which a voice call can be received, and a mobile information terminal through which various kinds of information content can be browsed over the Internet. In particular, as to the conventional mobile telephone, not only the number of users is increased, but also reliable service has to be provided. For example, various kinds of data communications such as reception/transmission of e-mails and content data browsing have been achieved by access to data communication networks such as the Internet.

On the other hand, it has been predicted that network congestion will rise with the increasing number

of users. In addition, the increasing data load due to the increased data quantities required by high-grade service will also clog networks. Consequently, even if communication speed is increased to a certain extent, the conventional communication terminal seems to take more time in data communications.

In the case where desired data is downloaded or target content data is browsed in the conventional communication terminal by accessing the Internet, a user of the conventional communication terminal recognizes completion of data communications by watching for a message indicating the completion of downloading or browsing of the content data that is displayed on a display screen, such as a liquid crystal display (LCD). However, as the time required for the data communications to complete becomes longer, the time when the user must carefully watch the display screen to recognize the completion of the data communications becomes longer as well. Moreover, it is necessary to carefully watch the display screen until the completion of transmission at the time of transmission of data, such as e-mail, from the communication terminal as well as at the time of data reception in the communication terminal.

Furthermore, in the case where a communication charge for the communication terminal is incurred for not

a communication data quantity but a line connection time, the user keeps a careful watch on the display screen to end a line connection as soon as the data communication has completed, thereby suppressing extra charges.

5 In consideration of the characteristics such as portability of the communication terminal, the downloading or browsing operation may be performed when the user is walking or riding in a car. Therefore, it is difficult or dangerous for the user to keep watching the display screen until the completion of the data communications such as downloading or browsing of the content data.

10 15 In view of these problems, there have been proposed various techniques relating to conventional communication terminals not requiring that the user thereof to carefully watch the display screen.

Such a conventional communication terminal will be discussed with reference to FIG. 1.

20 Referring to FIG. 1, a conventional communication terminal 10 is connected to a host computer 11 via a communication line 12. The communication terminal 10 includes a communication processing controller 13 for controlling communications with the host computer 11, an input unit 14 for inputting various kinds of instructions to the communication processing controller 13, a display

15, and a speaker 16. The communication processing controller 13 includes a data receiver 17 for receiving data from the host computer 11 via the communication line 12 and a speaker controller 18 for controlling a sound output of the speaker 16.

In the communication terminal 10, data from the host computer 11 is received by the data receiver 17 via the communication line 12 connected to the host computer 11 according to an instruction from the input unit 14. The communication processing controller 13 monitors the data receiver 17 as to whether the data from the host computer 11 has completely received. If the completion of data reception is detected, information indicative of the completion of the data reception is displayed on the display 15. Further, an output sound for giving a notice of the completion of the data reception is output from the speaker 16 under control of the speaker controller 18. Consequently, it is unnecessary for the user to keep a careful watch on the display 15 during the data reception, because the user can recognize the completion of the data reception by the output sound from the speaker 16.

This conventional communication terminal is disclosed in Japanese Patent Application Laid-open No. Hei 10-49491.

However, in the conventional communication terminal, the completion of the data reception is notified by the output sound irrespective of the amount of data received or the elapsed time period of the data reception. In the conventional communication terminal, in most cases, a small amount of data is communicated because of the small display screen. In general, the smaller the amount of data received, the shorter the data receiving period. Therefore, if the notification is performed by the output sound on every data reception, the sound bothers people who may be present around the place at which the communication terminal is used, and further, frequent notifications are undesirable for the user himself. In the conventional communication terminal, the user can preset whether the notification by the output sound is performed. However, if the output sound is preset to not ring for the notification, the data reception cannot be notified by the output sound even if the amount of received data is large.

20 SUMMARY OF THE INVENTION

It is therefore an object of the present invention to provide a communication terminal capable of suitably notifying a user of completion of a data communication.

In order to achieve the above objects, a communication terminal according to an embodiment of the

present invention comprises a receiver that receives data, and a controller that generates a notification at the completion of data reception according to the amount of data received.

5 Another communication terminal according to an embodiment of the present invention comprises a communication terminal, comprising a receiver that receives data, and a controller that generates a notification at the completion of data reception according to a time period for receiving the data.

10 In order to achieve the above objects, a method of generating a notification of completion of a data communication, according to an embodiment of the present invention, comprises receiving data, and generating a notification at the completion of data reception according to the amount of data received.

15 Another method of generating a notification of completion of a data communication, according to an embodiment of the present invention, comprises receiving data, and generating a notification at the completion of data reception according to a time period for receiving the data.

20 In order to achieve the above objects, a communication apparatus according to an embodiment of the present invention comprises a storage unit that stores

data, a communication unit that transmits the data based  
on request from a communication terminal, and a  
controller that converts the data such that a  
predetermined code is included in the data when an amount  
5 of the data to be transmitted to the communication  
terminal is larger than a predetermined amount.

In order to achieve the above objects, a  
communication system according to an embodiment of the  
present invention comprises a content data server that  
10 comprises a storage unit that stores data, a  
communication unit that transmits the data based on  
request from a communication terminal, and a controller  
that converts the data such that a predetermined code is  
included in the data when an amount of the data to be  
15 transmitted to the communication terminal is larger than  
a predetermined amount. The communication system further  
comprises a communication terminal that comprises a  
receiver that receives the data transmitted from said  
content data server, a detector that detects the  
20 predetermined code included in the data, and a controller  
that generates a notification at the completion of data  
reception when the predetermined code is detected by said  
detector.

Another communication system according to an  
embodiment of the present invention comprises a content

data server that comprises a storage unit that stores data, and a communication unit that transmits the data based on request from a communication terminal. The communication system further comprises a communication terminal that comprises a receiver that receives the data transmitted from the content data server, and a controller that generates a notification at the completion of data reception according to a time period for receiving the data.

In order to achieve the above objects, a method with a content data server and a communication terminal, according to an embodiment of the present invention, comprises requesting data transmission from the communication terminal to the content data server, retrieving data at the content data server according to the request from the communication terminal, converting the data at the content data server such that a predetermined code is included in the data when an amount of the data is larger than a predetermined amount, transmitting the data including the predetermined code from the content data server to the communication terminal, receiving the data including the predetermined code at the communication terminal, detecting the predetermined code at the communication terminal, and generating a notification at the completion of data

reception when the predetermined code is detected.

Another method with a content data server and a communication terminal comprises requesting data transmission from the communication terminal to the content data server, retrieving data at the content data server according to the request from the communication terminal, transmitting the data from the content data server to the communication terminal, receiving the data at the communication terminal, and generating a notification at the completion of data reception according to a time period of receiving the data at the communication terminal.

BRIEF DESCRIPTION OF THE DRAWINGS

These and other objects, features and advantages of this invention will become more fully apparent from the following detailed description taken with the accompanying drawings in which:

FIG. 1 is a block diagram showing a conventional communication terminal;

FIG. 2A is a block diagram showing a communication terminal according to a first embodiment of the present invention;

FIG. 2B is a block diagram showing a server according to the first embodiment of the present invention;

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FIGS. 3A and 3B are diagrams showing content data to be received by the communication terminal according to the first embodiment of the present invention;

5 FIG. 4 is a flowchart illustrating an operation of the communication terminal according to the first embodiment of the present invention;

FIGS. 5A to 5D illustrate examples of display screen images of the communication terminal according to the first embodiment of the present invention;

10 FIG. 6 is a block diagram showing a communication terminal according to a second embodiment of the present invention;

15 FIG. 7 is a flowchart illustrating an operation of the communication terminal according to the second embodiment of the present invention;

FIG. 8 illustrates a table showing call reception sound mode information used by a communication terminal according to a third embodiment of the present invention;

20 FIG. 9 is a flowchart showing an operation of a communication system with a communication terminal shown in FIG. 2A and a server shown in FIG. 2B according to the first embodiment of the present invention; and

25 FIG. 10 is a flowchart showing an operation of a communication system with a communication terminal shown in FIG. 6 and a content data server according to the

second embodiment of the present invention.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

The preferred embodiments of the present invention will be discussed by referring to the drawings.

5       (1) First Embodiment

An apparatus relating to notification of completion of data communications in a communication terminal according to a first embodiment of the present is shown in FIG. 2A. The communication terminal according to the first embodiment of the present invention comprises a line manager 20, a speaker 21, a vibrator 22, a driver 23 for activating the speaker 21 and the vibrator 22, a liquid crystal display (LCD) 24, an LCD driver 25 for controlling the LCD, a switch unit 26 for inputting various kinds of instructions, a controller 27 for controlling the communication terminal, and a memory 28 for storing therein control programs for the controller 27 and various kinds of setting information.

The line manager 20 manages line connection, e.g., the connection or disconnection of the communication line with mobile communication networks and data communication networks. The speaker 21 outputs a voice sound output during a speech or a notification sound for notifying an incoming call or completion of a data communication in accordance with an instruction from the controller 27 via

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the driver 23. The vibrator 22 is vibrated at a predetermined frequency in accordance with an instruction from the controller 27 via the driver 23. The driver 23 sends a control signal to the speaker 21 and/or the vibrator 22 in accordance with various kinds of instructions from the controller 27, to output the voice sound output or the notification sound from the speaker 21 or vibrate the vibrator 22. The LCD 24 displays the operating state of the communication terminal or an operation result by the switch unit 26. The LCD driver 25 sends a control signal to the LCD 24 in accordance with various kinds of display instructions from the controller 27, to display information such as an instructed character or a bit map on the LCD 24. The switch unit 26 includes various switches such as a push button to be operated by a user and other mode setting switches, and detects depression and release of each of the switches.

The controller 27 executes a browser in accordance with a control program stored in the memory 28, so as to display the content data described in a predetermined information describing language such as a HyperText Markup Language (HTML), a Handheld Device Markup Language (HDML), or a Wireless Markup Language (WML) defined by a 25 Wireless Application Protocol (WAP) system. Content data

in one of the above-mentioned formats is received from a server as shown in FIG. 2B on the data communication networks connected via the line manager 20. The controller 27 determines whether or not a predetermined notification code is described in the received content data. The notification code is described in the received content data if notification corresponding to the predetermined notification code is required to notify the user of the completing of the data communication of the received content data. In particular, the predetermined notification code is described in the received content data when an amount of the received content data is larger than a predetermined data amount. When the notification code is described in the received content data, the notification that corresponds to the predetermined notification code is given to the user. Consequently, it is possible to notify the user of the completion of the reception of the content data and/or the completion of display of the received content data.

Referring to FIG. 2B, a server according to a first embodiment of the present invention comprises a memory 100 that stores content data, a communication unit 101 that transmits the content data to the communication terminal and receives a signal from the communication terminal via wireless link (not shown) and/or landline

link (not shown), and a controller 102. The controller 102 determines whether an amount of the content data to be transmitted to the communication terminal is larger than a predetermined amount. When the amount of the content data is larger than the predetermined amount, the controller 102 converts the content data stored in the memory 100 such that the predetermined notification code is included in the content data and then transmits the converted content data to the communication terminal through the communication unit 101. Otherwise, the predetermined notification code may be previously described in the content data without any conversion process in the server.

An outline of the content data to be received by the communication terminal is shown in FIGS. 3A and 3B. The outline of the configuration of the content data is shown in FIG. 3A. An example of description in the HTML as an information describing language representing the content data is shown in FIG. 3B. The content data 30 consists of a HyperText Transfer Protocol (HTTP) header 31 and contents 32, as illustrated in FIG. 3A. The HTTP header 31 defines a transfer protocol in the data communication network connected via the line manager 20. In the meantime, the controller 27 executes the browser, so that the contents 32 define information to be

displayed on the LCD 24 in a predetermined information describing language such as the HTML.

The information describing language can decorate a character or can designate a layout in accordance with a reserved word code sandwiched between marks "<" and ">" in a text file format. The reserved word code with the marks is called a tag. Such various designations can be made by data located between a first tag wherein a reserved word code is sandwiched between the marks "<" and ">" and a second tag wherein the same reserved word code is sandwiched between marks "</" and ">". For example, in FIG. 3B, the content data are defined or designed by data described between the first tag "<HTML>" and the second tag "</HTML>". A character string "MENU" defined between "<HEAD>" and "</HEAD>" and between "<TITLE>" and "</TITLE>" can be displayed on the LCD 24 as a title. Furthermore, this information describing language is featured in that specific display data can be linked to the content data described in another information describing language. Consequently, data of a large capacity to be linked can be taken in only when it is needed, as long as the displayed content data per se has even the description for displaying. Here, a character string "Internet Service" defined between "<A HREF = XYZ>" and "</A>" is linked to a destination

designated by "A HREF = XYZ." Therefore, the content  
data linked to the character string "Internet Service"  
can be acquired by selecting the character string  
"Internet Service." In FIG. 3B, a character string "ZZZ"  
5 is described as a predetermined notification code for a  
data communication completion alert. The character  
string "ZZZ" is described in the contents 32 as the  
predetermined notification code if an amount of the  
content data 30 is larger than a predetermined data  
amount.

10 In the controller 27, the tag described as the  
content data in such information describing language is  
interpreted by the browser of the communication terminal,  
to be displayed on the LCD 24. At that time, the  
controller 27 detects a predetermined notification code  
15 described in the content data. The controller 27  
notifies the user of a data communication completion  
alert as an output sound by the speaker 21 and/or  
vibration by the vibrator 22 when the predetermined  
notification code is detected. This predetermined  
20 notification code is linked directly to the function of  
generating the output sound by the speaker 21 or the  
function of generating the vibration by the vibrator 22  
at the time of execution of the browser.

25 The controller 27 includes a central processing

unit (not shown), which can perform the above-described control in accordance with the control program stored in the memory 28.

The switch unit 26 is actuated to set various modes of incoming call notification for notifying the user that an incoming call from the mobile communication network is received. The various modes of the incoming call notification, which can be set by the user through the switch unit 26, include a high volume sound, a middle volume sound, a low volume sound, a stepwise volume sound wherein the volume of the speaker's sound is stepwise increased with a lapse of time, no sound, and vibration by the vibrator 22. The user can selectively set at least one mode for the incoming call notification. The set modes are stored in the memory 28 as incoming call notification information. Similarly, the user sets at least one of the notification modes for a data communication completion alert. The set mode is also stored in the memory 28 as data communication completion alert information. Moreover, the user can set allowance or prohibition of the alert at the time of the completion of the data communications by the operation of the switch unit 26. This set operation mode also are stored in the memory 28 as alert setting information.

A flowchart illustrating an outline of an operation

by the controller 27 is shown in FIG. 4. The controller  
27 monitors a starting notification of data  
communications via the communication line connected to a  
server as shown in FIG. 2B on data communication networks  
5 (step S40: N). Content data to be communicated are  
stored in the server as shown in FIG. 2B. The starting  
notification is generated from the line manager 20. When  
the starting notification is detected by the controller  
27 (step S40: Y), it is determined whether a generation  
10 of a data communication completion alert is allowed upon  
the completion of the data communications in reference to  
the alert setting information previously stored in the  
memory 28 (step S41). When it is determined that the  
generation of the alert is prohibited upon the completion  
15 of the data communications in reference to the alert  
setting information (step S41: N), another starting  
notification of data communication from the line manager  
20 is monitored again (Return).

When it is determined in step S41 that the  
20 generation of the alert is allowed upon the completion of  
the data communications (step S41: Y), the completion  
notification of the data communications in which the  
starting notification is performed via the line manager  
20 in step S40 is monitored (step S42: N). When the  
25 completion notification is detected (step S42: Y), the

controller 27 has acquired content data which the line manager 20 received from the server over the data communication networks.

The content data received from the server is text data or binary data. The controller 27 executes a browser program stored in the memory 28 without converting the content data when the acquired content data is text data, so as to display the content data on the LCD 24 via the LCD driver 25. A predetermined notification code for the data communication completion alert is previously described in the content data in the above-mentioned conditions. The controller 27 determines the existence of the notification code (step S43).

On the other hand, when the content data is binary data, the controller 27 converts the content data into content data in a text format described in the HTML. In this manner, the content data is received as the binary data, thereby enhancing band-utilizing efficiency, which is thus suitable for a communication line in a narrow band such as a mobile communication network. The controller 27 executes the browser program stored in the memory 28 to display the content data in the converted text format on the LCD 24 via the LCD driver 25. At that time, the predetermined notification code for the data communication completion alert is previously described in

the content data in the above-mentioned conditions. The controller 27 determines the existence of the notification code (step S43).

When it is determined in step S43 that there is no notification code (step S43: N), the sequence returns to step S40, in which another starting notification of data communication from the line manager 20 is monitored again (Return). In the meantime, when it is determined that there is a predetermined notification code for the data communication completion alert (step S43: Y), the data communication completion alert information previously stored in the memory 28 is read (step S44). And then, the data communication completion is notified according to the data communication completion alert information indicative of the set notification mode previously set by the user (step S45). Thereafter, another starting notification of data communication from the line manager 20 is monitored again (Return).

Specific operation of the communication terminal according to the first embodiment of the present invention will be discussed in reference to FIGS. 5A to 5D.

A menu screen image for selecting an access to the Internet service as the data communication network is shown in FIG. 5A. A menu screen image for selecting

content data to be received is shown in FIG. 5B. A display screen image in which the selected content data is being received is shown in FIG. 5C. A display screen image of the received content data is shown in FIG. 5D.

5       The communication terminal is equipped with the functions of Internet access, an address book, and a phone-answering setting in addition to the conventional telephone function over the mobile communication network as shown in FIG. 5A. These functions are described in the information describing language such as the HTML previously stored in the memory 28, and can be set on the menu screen displayed on the LCD 24 via the browser. Each of selection items is linked to content data described on a menu screen displayed at the time of selection. Consequently, when the user selects the Internet service through a switch operation by the switch unit 26, as illustrated in FIG. 5A, the content data linked in the information describing language are displayed. In this case, the display result is

10      illustrated in FIG. 5B. Here, when the user selects data relating to sports as shown in FIG. 5B, the communication terminal is connected to the Internet via the line manager 20. At this time, the controller 27 allows the LCD 24 to display thereon "data downloading," as

15      illustrated in FIG. 5C, thereby notifying the user that

20

25

the data is being acquired.

The line manager 20 connects the communication terminal to the server on the Internet, storing therein content data including desired sports data, and further, notifies the controller 27 of the starting of data communications. Here, assuming that the user previously allows a data communication completion alert to be set, the controller 27 monitors data communication completion notification representing the reception completion of the content data in the text format including the sports data on the server from the line manager 20. Upon detection of the data communication completion notification, the controller 27 displays the content data received by the browser on the LCD 24, and further, determines whether or not there is a predetermined notification code for a data communication completion alert in the received content data.

Here, it is assumed that the user previously sets the notification mode for the data communication completion alert such that the output sound of a high volume is rung twice. When it is determined that there is the predetermined notification code in the content data to be displayed, the output sound with the high volume is rung only twice by the speaker 21, thereby notifying the user of the data communication completion,

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and further, the received content data is displayed on the LCD 24, as illustrated in FIG. 5D. Otherwise, it is assumed that the user sets a vibration mode for 1 second as the notification mode for the data communication completion alert. When it is determined that there is the predetermined notification code in the content data to be displayed, the vibrator 22 is vibrated for only 1 second, thereby notifying the user of the data communication completion, and further, the received content data is displayed on the LCD 24, as illustrated in FIG. 5D.

In the communication terminal according to the first embodiment of the present invention, the user previously sets the notification mode that is notified as the data communication completion alert. The line manager 20 starts the data communications, and retrieves the received content data. It is determined whether the predetermined notification code for the data communication completion alert is included in the received content data. If it is determined that there is the predetermined notification code, the user is notified of the data communication completion alert in the previously set notification mode. Consequently, since the data communication completion alert to the user is controlled in accordance with the received content data,

it is unnecessary to carefully watch the display screen until the completion of the data communications, and further, it is possible to prevent any generation of frequent alerts caused by too short time period data communications. Additionally, since the user can previously set the allowance or prohibition of the data communication completion alert, it is possible to prevent any generation of the data communication completion alert according to the use environment of the user who uses the communication terminal even if the notification code for the data communication completion alert is included in the content data content data, thus providing the communication terminal with more flexibility.

Although in the communication terminal according to the first embodiment the data communication completion alert is generated based on the predetermined notification code, the data communication completion alert may be readily notified upon each data communication completion, like in the conventional communication terminal, by using a tag "</HTML>" as the predetermined notification code. Here, the tag "</HTML>" is an HTML ending tag in the case of the received content data described in the HTML. Similarly, the data communication completion alert may be readily notified upon each data communication completion, like in the

conventional communication terminal, by using a tag "«/wml»" as the predetermined notification code. Here, the tag "«/wml»" is a WML ending tag in the case of the content data described in the WML. That is, because these tags "«/HTML»" and "«/wml»" are always described in the content data in the HTML and WML protocols, respectively, the data communication completion alert can be performed for each data communication completion by detecting these tags.

Next, an operation of communication systems with a communication terminal shown in FIG. 2A and a server shown in FIG. 2B will be discussed with reference to FIG. 9.

The communication terminal transmits a request signal to the server to transmit data (S101). When the request signal is received by the server via the communication unit 101 (S102), the server retrieves data from the memory 100 (S103) and converts the data such that a predetermined code is included in the data if an amount of the data is larger than a predetermined amount (S104). The server transmits the data including the predetermined code to the communication terminal (S105). The communication terminal receives the data including the predetermined code (S106) and detects the predetermined code (S107). When the predetermined code

is detected, the communication terminal generates a notification at the completion of data reception (S108).

(2) Second Embodiment

In a communication terminal according to a second embodiment of the present invention, it is determined that a data communication completion alert is generated according to a time period of data communication. Therefore, measurement of a data communication time period can dispense with not only a change of the content data but also notification code detection during execution of a browser.

A communication terminal according to a second embodiment of the present invention will be discussed with reference to FIG. 6. Here, the same component parts as those of the communication terminal according to the first embodiment are designated by the same reference numerals, and therefore, the explanation thereof will be omitted. The communication terminal according to the second embodiment comprises a line manager 20, a speaker 21, a vibrator 22, a driver 23 for activating the speaker 21 and the vibrator 22, an LCD 24, an LCD driver 25 for activating the LCD, a switch unit 26, a timer 50, a controller 51 for controlling component parts in the communication terminal, and a memory 52 for storing therein control programs for the controller 51 and

various kinds of setting information.

The communication terminal according to the second embodiment is featured by comprising the timer 50 for generating a data communication completion alert according to a measured data communication time period. Thus, even in the case of a small data communication quantity or in case of network congestion due to some circumstances, the completion of the data communications is notified after the data communications for a predetermined time period. Furthermore, it is possible to prevent any generation of an alert in the case of a data communication time period during which it is unnecessary to keep a careful watch on a display screen. Consequently, it is unnecessary to describe a predetermined notification code in content data, unlike in the first embodiment of the present invention.

The controller 51 includes a CPU (not shown) which can perform the above-described control in accordance with a control program stored in the memory 52.

An operation of the controller 51 according to a control program stored in the memory 52 is shown in FIG. 7. The controller 51 monitors a starting notification of the data communications via a communication line connected to a server (not shown) on data communication networks (step S60: N). Content data to be communicated

are stored in the server (not shown). The starting notification is generated from the line manager 20. When the starting notification is detected by the controller 51 (step S60: Y), it is determined whether a generation 5 of a data communication completion alert is allowed upon the completion of the data communications in reference to alert setting information previously stored in the memory 52 (step S61). When it is determined that the generation of the alert is prohibited upon the completion of the data communications in reference to the alert setting information (step S61: N), another data communication starting notification from the line manager 20 is monitored again (Return).

When it is determined in step S61 that the 15 generation of the alert is allowed upon the completion of the data communications (step S61: N), a timer value N seconds (N is a positive integer) is set to the timer 50 (step S62), and further, the timer 50 starts counting the timer value (step S63). In this manner, the timer 50 counts down the timer value for a predetermined time 20 interval.

Subsequently, the controller 51 monitors a 25 completion notification of the data communications in which the starting notification is performed in step S60 from the line manager 20 (step S64: N). The completion

notification is also generated by the line manager 20. When the completion notification is detected (step S64: Y), the controller 51 stops the counting by the timer 50 (step S65). It is determined whether the timer value has counted down to zero seconds (step S66). If it is determined that the timer value of the timer 50 is equal to zero seconds (step S66: N), it is determined that the data communication time period is shorter than the threshold value N seconds. In this case, no data communication completion alert is generated, thereby monitoring another data communication starting notification from the line manager 20 again (Return).

In contrast, if it is determined in step S66 that the timer value of the timer 50 is zero seconds (step S66: Y), it is determined that the data communication period is longer than the threshold value N seconds. The line manger 20 acquires the content data received over the data communication networks.

The controller 51 executes a browser program stored in the memory 52 without data conversion when the acquired content data is text data, so as to display the content data on the LCD 24 via the LCD driver 25. To the contrary, when the acquired content data is binary data, the controller 51 converts the content data into content data in a text format described in the HTML. Thereafter,

the controller 51 executes the browser program stored in the memory 52, to display the converted content data on the LCD 24 via the LCD driver 25.

A data communication completion alert information indicative of at least one of notification modes, such as some volume of a speaker's sound and a vibrator's vibration, previously stored in the memory 52 is read when it is determined that data communication time period is longer than the threshold value N (step S67). Thereafter, the data communication completion is notified according to the notification mode previously set by the user (step S68). Subsequently, another data communication starting notification from the line manager 20 is monitored again (Return).

It is assumed that 30 seconds is set as the timer value N of the timer 50 and the user previously sets the data communication completion alert information such that the output sound at a high volume is rung twice. If an access is made to the Internet and a time period spent for the reception of the content data is 30 seconds or longer, a output sound at the high volume is rung only twice by the speaker 21, thereby notifying the user of the data communication completion, and further, the received content data is displayed on the LCD 24. However, if the time period spent for the reception of

the content data does not exceed 30 seconds, no data communication completion alert is generated.

Otherwise, it is assumed that 30 seconds is set as the timer value N of the timer 50 and the user previously sets vibration for 1 second as the data communication completion alert information. When an access is made to the Internet and a time period spent for the reception of the content data is 30 seconds or longer, the vibrator 22 is vibrated for only 1 second, thereby notifying the user of the data communication completion. Moreover, the received content data can be displayed on the LCD 24. However, if the time period spent for the reception of the content data does not exceed 30 seconds, no data communication completion alert is generated.

In the communication terminal according to the second embodiment, the user previously sets the data communication completion alert information indicative of the notification mode that is used for the data communication completion alert. After the starting of the data communications, the predetermined timer value is set in the timer 50, and then, the time counting is started. Upon the notification of the data communication completion from the line manager 20, if the timer value counted by the timer 50 is not zero seconds or shorter, no data communication completion alert is generated. In

contrast, if the timer value is zero seconds or shorter, the user is notified of the data communication completion alert according to the previously set notification mode. Thus, even in the case of a small data communication quantity or in the event of network congestion due to some circumstances, it is possible to avoid a problem of the need of keeping a careful watch on the display screen until the completion of the data communication. It is possible to notify the completion of the data communication only when the time period of the data communications exceeds a predetermined time period, so as to prevent any useless generation of the data communication completion alert during the short data communications. Consequently, it is possible to notify the data communication completion alert according to the use environment of the user who uses the communication terminal. Moreover, since there is no need of description of a predetermined notification code in the content data for the data communication completion alert, it is possible to readily use the communication terminal according to the present invention in the existing Internet system.

As to the communication terminal according to the second embodiment, the timer value of the timer 50 is counted down from N seconds which is set at the starting

of the data communications. However, the present invention is not limited to this communication terminal. The timer value of the timer 50 may be counted up from 0 seconds. After the notification of the completion of the data communications, the count result is compared with a predetermined threshold value. If the count result is smaller than the predetermined threshold value, no alert for the completion of the data communications is generated. To the contrary, if the count result is equal to or greater than the predetermined threshold value, a data communication completion alert is notified. At any rate, it is sufficient only to find the result of the comparison between the data communication time period and the predetermined threshold value.

Next, an operation of communication systems with a communication terminal shown in FIG. 6 and a content data server will be discussed with reference to FIG. 10.

The communication terminal transmits a request signal to the content data server to transmit data (S201). When the request signal is received by the content data server (S202), the content data server retrieves data from the memory 100 (S203) and transmits the data (S204). The communication terminal receives the data (S205) and calculates a time period for receiving the data (S206). When the calculated time period for

receiving the data is larger than a predetermined time period, the communication terminal generates a notification at the completion of data reception (S207).

(3) Third Embodiment

As to the communication terminal according to the first embodiment, the notification of the data communication completion alert is performed according to the notification mode previously set by the user when it is determined that the predetermined notification code is included in the received content data. However, the present invention is not limited to this communication terminal. For example, a corresponding notification mode on a side of a communication terminal is set in accordance with a predetermined notification code included in received content data, thereby the notification of the data communication completion alert is executed according to the set notification mode set in correspondence with the predetermined notification code.

A configuration of data communication completion alert information used in a communication terminal according to a third embodiment of the present invention is shown in FIG. 8. A user previously sets a plurality of notification modes 72 designating a type of notification for each communication type 71. The communication type 71 is determined by a predetermined

notification code included in a received content data. When it is determined that there is a predetermined notification code in the content data received in step S43 of FIG. 4, the notification mode 72 previously stored in a memory in such a manner as to correspond to the communication type 71 of the predetermined notification code. Based on the call reception setting information 72, data communication completion is notified by a speaker 21 and/or a vibrator 22.

For example, in FIG. 8, a communication type B corresponds to a predetermined notification code BBB. When there is the predetermined notification code BBB in a received content data, a data communication completion alert is notified according to a notification mode BB stored in association with the communication type B.

The user of the communication terminal is notified according to one of the previously set notification modes corresponding to the communication types, and therefore, the user can recognize the communication type wherein its data communication has completed based on a notification method performed according to the notification mode. In the case where a plurality of types of data communications are performed in sequence, the user can confirm which data communication has completed at the present.

The invention may be embodied in other specific forms without departing from the spirit or essential characteristics thereof. The embodiments of the present invention described here are therefore to be considered  
5 in all respects as illustrative and not restrictive, the scope of the invention being indicated by the appended claims rather than by the foregoing description and all changes which come within the meaning and range of equivalency of the claims are therefore intended to be  
10 embraced therein.

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CLAIMS

What is claimed is:

1. A communication terminal, comprising:  
a receiver that receives data; and  
a controller that generates a notification at the  
completion of data reception according to the amount of  
data received.

2. The communication terminal as claimed in  
claim 1, wherein said controller generates the  
notification when the amount of the data is larger than a  
predetermined amount.

3. The communication terminal as claimed in  
claim 2, further comprising:  
an input unit that sets a notification prohibiting  
mode to said controller, whereby said controller does not  
generate the notification even if the amount of the data  
is larger than the predetermined amount.

4. The communication terminal as claimed in  
claim 2 wherein said controller comprises:  
a detector that detects a predetermined code  
indicating that the amount of the data is larger than the

5 predetermined amount, and

said controller generates the notification when  
said detector detects the predetermined code.

5. The communication terminal as claimed in  
claim 4, further comprising:

an input unit that sets a notification prohibiting  
mode to said controller, whereby said controller does not  
5 generate the notification even though the predetermined  
code is detected.

6. The communication terminal as claimed in  
claim 4, further comprising:

a storage unit that stores notification information  
indicative of a notification pattern for the  
5 notification.

7. The communication terminal as claimed in  
claim 6, wherein said controller generates the  
notification according to the information stored in said  
storage unit, wherein the information corresponds to the  
5 predetermined code detected by said detector.

8. The communication terminal as claimed in  
claim 7, wherein said storage unit that stores a

plurality of notification patterns as the notification information, wherein each of the plurality of notification patterns is stored in association with the predetermined code.

9. The mobile communication terminal as claimed in claim 8, wherein said controller generates the notification with one of the plurality of notification patterns stored in said storage unit according to the predetermined code detected by said detector.

10. The communication terminal as claimed in claim 1, further comprising:

a storage unit that stores notification information indicative of a notification pattern for the notification.

11. The communication terminal as claimed in claim 10, wherein said controller generates the notification according to the notification information stored in said storage unit.

12. The communication terminal as claimed in claim 1, wherein the data is described by one of a hypertext markup language, a handheld device markup

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language and a wireless markup language.

13. The communication terminal as claimed in  
claim 1, further comprising:

at least one of a speaker and a vibrator operated  
based on the notification generated from said controller.

14. The communication terminal as claimed in  
claim 1, further comprising:

a display unit that displays the data when the data  
has completely received by said receiver.

15. A communication terminal, comprising:  
a receiver that receives data; and  
a controller that generates a notification at the  
completion of data reception according to a time period  
for receiving the data.  
5

16. The communication terminal as claimed in  
claim 15, wherein said controller generates the  
notification when the time period is longer than a  
predetermined time period.

17. The communication terminal as claimed in  
claim 16, further comprising:

5

an input unit that sets a notification prohibiting mode to said controller, whereby said controller does not generate the notification even if the time period is longer than the predetermined time period.

18. The communication terminal as claimed in claim 16, wherein said controller comprises:

a counter that counts the time period in receiving the data; and

5 a determiner that determines whether the time period counted by said counter is longer than the predetermined time period.

19. The communication terminal as claimed in claim 15, wherein the data is described by one of a hypertext markup language, a handheld device markup language and a wireless markup language.

20. The communication terminal as claimed in claim 15, further comprising:

at least one of a speaker and a vibrator operated based on the notification generated from said controller.

21. The communication terminal as claimed in claim 15, further comprising:

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a display unit that displays the data when the data has completely received by said receiver.

22. The communication terminal as claimed in claim 15, further comprising:

a storage unit that stores notification information indicative of a notification pattern for the notification.

5

23. The communication terminal as claimed in claim 22, wherein said controller generates the notification according to the notification information stored in said storage unit.

24. A method of generating a notification of completion of a data communication, the method comprising:

receiving data; and

generating a notification at the completion of data reception according to the amount of data received.

5

25. The method as claimed in claim 24, wherein the notification is generated when the amount of the data is larger than a predetermined amount.

26. The method as claimed in claim 25, further comprising:

detecting a predetermined code that indicates that the amount of the data is larger than the predetermined amount, and wherein

generating the notification when the predetermined code is detected.

27. A method of communication terminal, comprising:

receiving data; and

generating a notification at the completion of data reception according to a time period for receiving the data.

28. The method as claimed in claim 27, wherein the notification is generated when the time period is longer than a predetermined time period.

29. The communication terminal as claimed in claim 28, further comprising:

counting the time period in receiving the data; and determining whether the counted time period is

longer than the predetermined time period.

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30. A communication apparatus, comprising:  
a storage unit that stores data;  
a communication unit that transmits the data based  
on request from a communication terminal; and  
5 a controller that converts the data such that a  
predetermined code is included in the data when an amount  
of the data to be transmitted to the communication  
terminal is larger than a predetermined amount.

31. A communication system, comprising:  
a content data server that comprises:  
a storage unit that stores data;  
a communication unit that transmits the data based  
5 on request from a communication terminal; and  
a controller that converts the data such that a  
predetermined code is included in the data when an amount  
of the data to be transmitted to the communication  
terminal is larger than a predetermined amount; and  
10 a communication terminal that comprises:  
a receiver that receives the data transmitted from  
said content data server;  
a detector that detects the predetermined code  
included in the data; and  
15 a controller that generates a notification at the  
completion of data reception when the predetermined code

is detected by said detector.

32. A communication system, comprising:  
a content data server that comprises:  
a storage unit that stores data; and  
a communication unit that transmits the data based

5 on request from a communication terminal; and

a communication terminal that comprises:  
a receiver that receives the data transmitted from  
said content data server; and  
a controller that generates a notification at the  
completion of data reception according to a time period  
10 for receiving the data.

33. A method with a content data server and a  
communication terminal, the method comprising:

requesting data transmission from the communication  
terminal to the content data server;

5 retrieving data at the content data server  
according to the request from the communication terminal;

converting the data at the content data server such  
that a predetermined code is included in the data when an  
amount of the data is larger than a predetermined amount;

10 transmitting the data including the predetermined  
code from the content data server to the communication

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terminal;  
receiving the data including the predetermined code  
at the communication terminal;  
15 detecting the predetermined code at the  
communication terminal; and  
generating a notification at the completion of data  
reception when the predetermined code is detected.

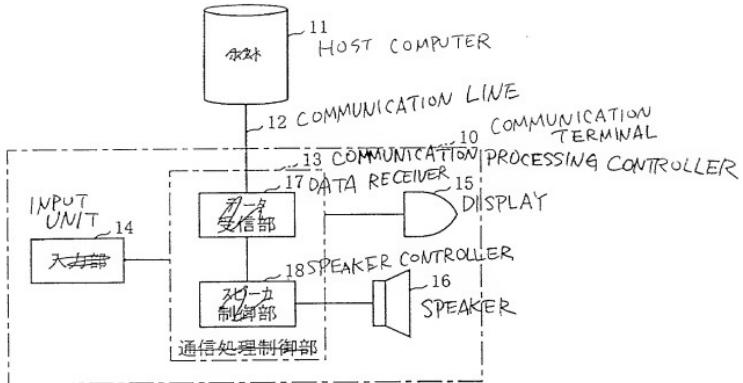
34. A method with a content data server and a  
communication terminal, the method comprising:  
requesting from the communication terminal to the  
content data server;  
5 retrieving data at the content data server  
according to the request from the communication terminal;  
transmitting the data from the content data server  
to the communication terminal;  
receiving the data at the communication terminal;  
10 and  
generating a notification at the completion of data  
reception according to a time period of receiving the  
data at the communication terminal.

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ABSTRACT

A communication terminal generates a notification at the completion of data reception according to the amount of data received or a time period for receiving data. A communication system has a communication terminal and a content data server storing data. On request from the communication terminal, the content data server retrieves the data, converts the data such that a predetermined code is included in the data when an amount of the data is larger than a predetermined amount, and transmits the data including the predetermined code to the communication terminal. The communication terminal receives the data including the predetermined code, detects the predetermined code, and generates a notification at the completion of data reception when the predetermined code is detected. In another communication system having a communication terminal and a content data server, the content server transmits data on request from the communication terminal. The communication terminal receives the data and generates a notification at the completion of data received according to a time period for receiving the data.

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Fig. 1

Prior Art

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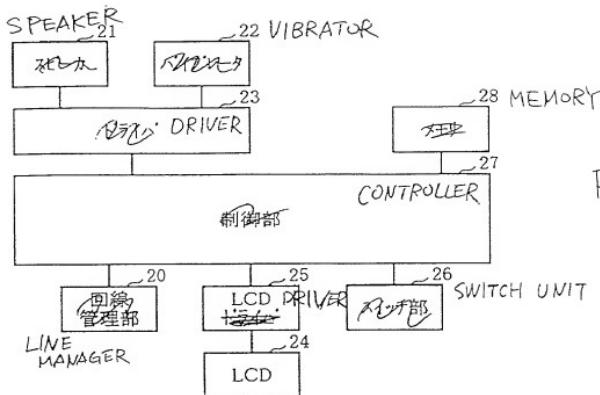


Fig. 2A

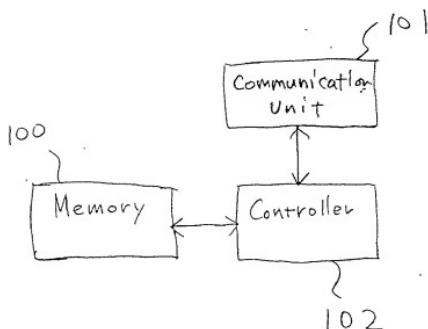


Fig. 2B

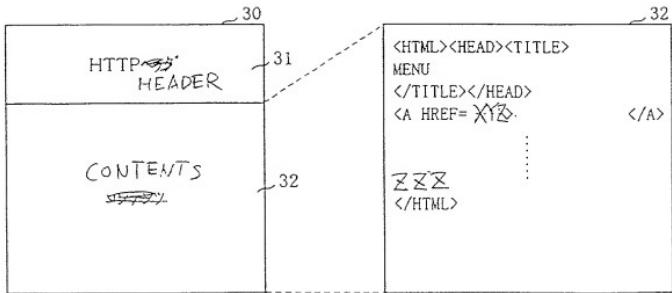


Fig. 3A  
(a)

Fig. 3B  
(b)

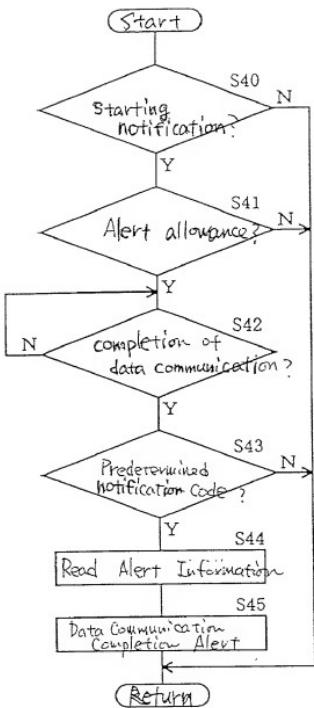
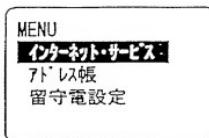


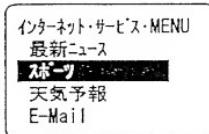
Fig. 4

Fig.5A (a)



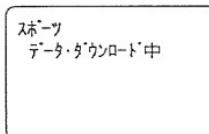
Internet Service  
Address Book  
Answering Phone Setting

Fig.5B (b)



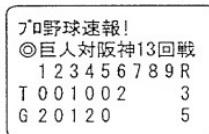
Internet Service MENU  
News  
**Sports**  
Weather  
E-mail

Fig.5C  
(c)



Sports  
data: downloading

Fig.5D  
(d)



Professional Baseball News  
Giants v. Tigers (13th Game)

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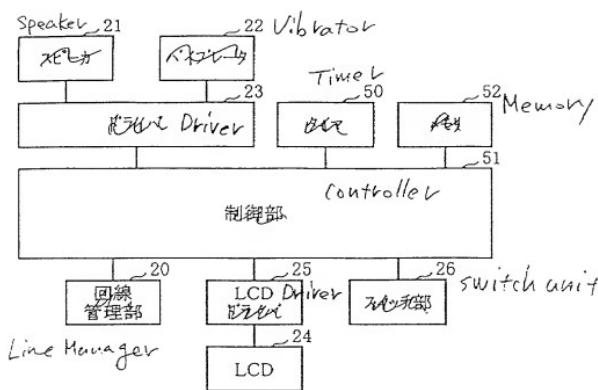
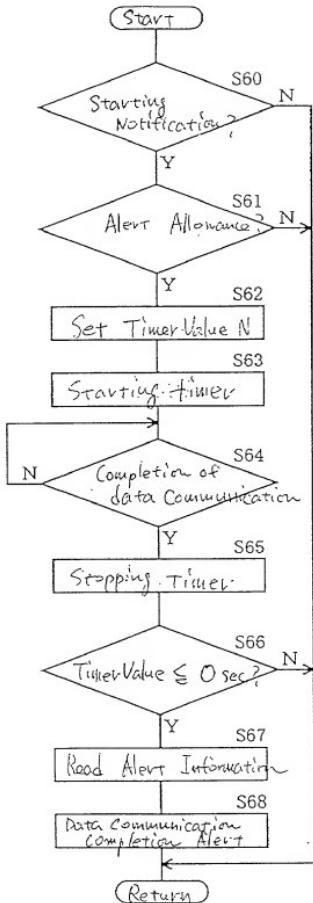


Fig. 6

Fig. 7



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Communication Type A	Notification Mode AA
Communication Type B	Notification Mode BB
...	...
Communication Type Z	Notification Mode ZZ

Fig. 8

FIG. 9

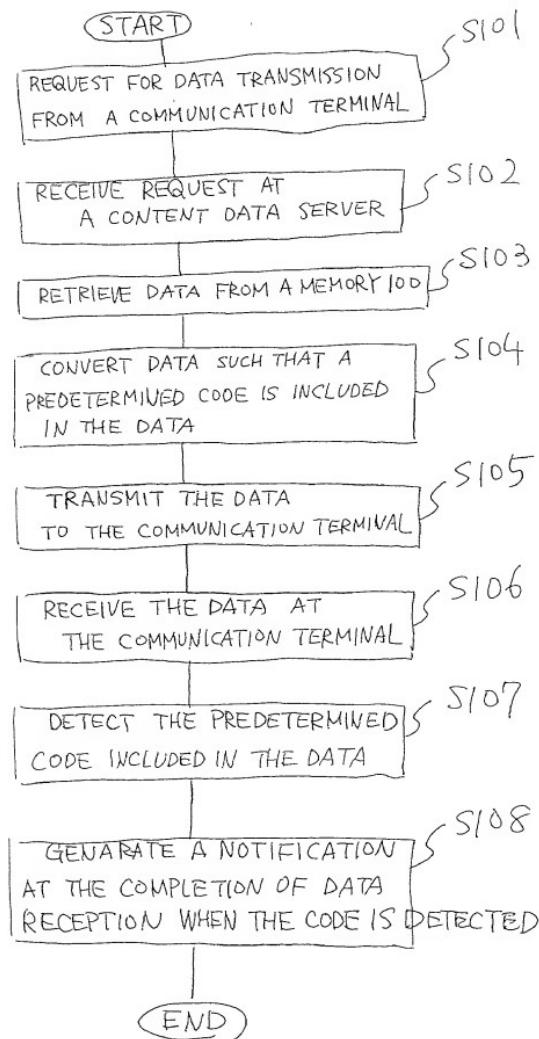
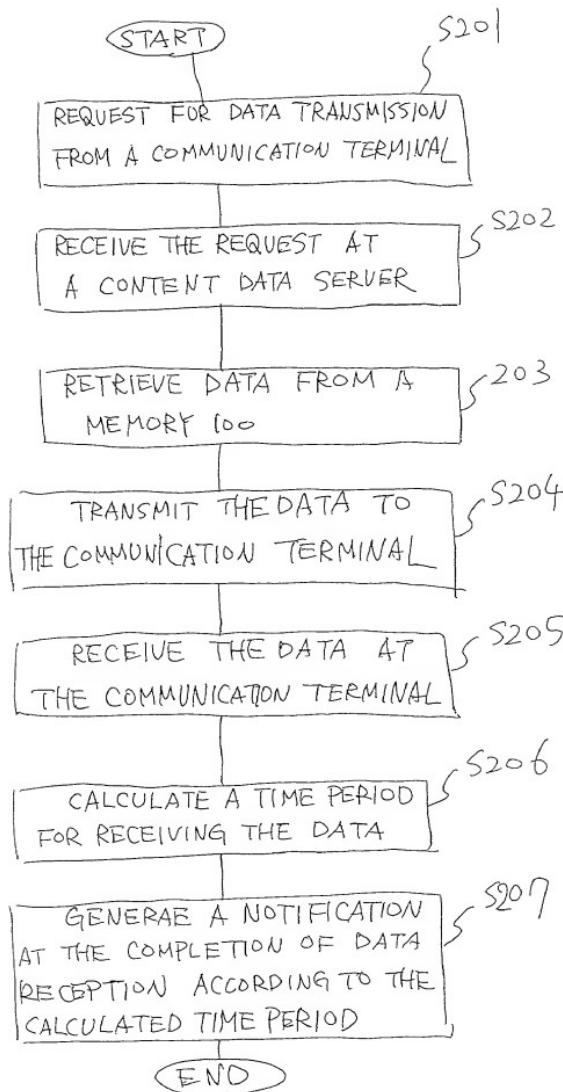


FIG.10

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# Declaration and Power of Attorney for Patent Application

特許出願宣言書

## Japanese Language Declaration

私は、下欄に氏名を記載した発明として、以下の通り宣言する：

私の住所、郵便の宛先および国籍は、下欄に氏名に統いて記載したとおりであり。

名称の発明に関し、請求の範囲に記載した特許を求める主題の本来の、最初にして唯一の発明者である（一人の氏名のみが下欄に記載されている場合）か、もしくは本来の、最初にして共同の発明者である（複数の氏名が下欄に記載されている場合）と信じ、

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

宣誓文書用紙

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その明細書を  
(該当するほうに印を付す)

ここに添付する。

\_\_\_\_\_ 日に出願番号

第 \_\_\_\_\_ 号として提出し、

日に補正した。

(該当する場合)

### COMMUNICATION TERMINAL FOR DATA

### COMMUNICATIONS

the specification of which  
(check one)

is attached hereto.

was filed on \_\_\_\_\_ as

Application Serial No. \_\_\_\_\_

and was amended on \_\_\_\_\_  
(if applicable)

私は、前記のとおり補正した請求の範囲を含む前記明細書の内容を検討し、理解したことを探述する。

I hereby state that I have reviewed and understand the contents of the above-identified specification, including the claims, as amended by any amendment referred to above.

私は、連邦規則法典第37部第1章第56条(a)項に従い、本願の審査に所要の情報を開示すべき義務を有することを認めらる。

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

# Japanese Language Declaration

私は、合衆国法典第35部第119条、第172条、又は第365条に基づく下記の外国特許出願又は発明者証出願の外国優先権利益を主張し、さらに優先権の主張に係わる基準出願の出願日前の出願日を有する外国特許出願又は発明者証出願を以下に明記する。

## Prior foreign applications

先の外国出願

Priority claimed 優先権の主張		
<input checked="" type="checkbox"/>	Yes あり	No なし
<input type="checkbox"/>	Yes あり	No なし
<input type="checkbox"/>	Yes あり	No なし
<input type="checkbox"/>	Yes あり	No なし
<input type="checkbox"/>	Yes あり	No なし
<input type="checkbox"/>	Yes あり	No なし

私は、合衆国法典第35部第120条に基づく下記の合衆国特許出願の利益を主張し、本願の請求の範囲各項に記載の主題が合衆国法典第35部第121条第1項に規定の要件で先の合衆国出願に開示されていない限りにおいて、先の出願の出願日と本願の国内出願日又はPCT国際出願日の間に公表された遅延規則法典第37部第1章第56条(a)項に記載の所要の情報を開示すべき義務を有することを認める。

I hereby claim foreign priority benefits under Title 35, United States Code §119, §172 or §365 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed.

I hereby claim the benefit of Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §112, I acknowledge the duty to disclose any material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application:

(Application Serial No.) (出願番号)	(Filing Date) (出願日)	(現況) 的訴済み、保属中、放棄済み	(Status) (patented, pending abandoned)
(Application Serial No.) (出願番号)	(Filing Date) (出願日)	(現況) 的訴済み、保属中、放棄済み	(Status) (patented, pending abandoned)

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I hereby declare that all statements made herein of my own knowledge are true; and further that all statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

# Japanese Language Declaration

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(代理人氏名及び登録番号を明記のこと)

POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith (list name and registration number)

I hereby appoint John H. Mion, Reg. No. 18,879; Donald E. Zinn, Reg. No. 19,046; Thomas J. Macpeak, Reg. No. 19,292; Robert J. Seas, Jr., Reg. No. 21,092; Darryl Mexic, Reg. No. 23,063; Robert V. Sloan, Reg. No. 22,775; Peter D. Olexy, Reg. No. 24,513; J. Frank Osha, Reg. No. 24,625; Waddell A. Biggart, Reg. No. 24,861; Robert G. McMorrow, Reg. No. 19,093; Louis Gubinsky, Reg. No. 24,835; Neil B. Siegel, Reg. No. 25,200; David J. Cushing, Reg. No. 28,703; John R. Inge, Reg. No. 26,916; Joseph J. Ruch, Jr., Reg. No. 26,577; Sheldon I. Landsman, Reg. No. 25,430; Richard C. Turner, Reg. No. 29,710; Howard L. Bernstein, Reg. No. 25,665; Alan J. Kasper, Reg. No. 25,426; Kenneth J. Burchfiel, Reg. No. 31,333; Gordon Kit, Reg. No. 30,764; Susan J. Mack, Reg. No. 30,951; Frank L. Bernstein, Reg. No. 31,484; Mark Boland, Reg. No. 32,197; William H. Mandir, Reg. No. 32,156; Scott M. Daniels, Reg. No. 32,582; Brian W. Hannon, Reg. No. 32,778; Abraham J. Rosner, Reg. No. 33,276; Bruce E. Kramer, Reg. No. 33,725; Paul F. Neils, Reg. No. 33,102; and Brett S. Sylvester, Reg. No. 32,765, my attorneys to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith, and request that all correspondence about the application be addressed to SUGHRUE, MION, ZINN, MACPEAK & SEAS, PLLC, 2100 Pennsylvania Avenue, N.W., Washington, D.C. 20037-3202.

書類の送付先：

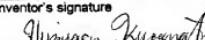
Send Correspondence to:

SUGHRUE, MION, ZINN, MACPEAK & SEAS  
2100 Pennsylvania Avenue, N.W., Washington, D.C. 20037

直通電話連絡先： (名称及び電話番号)

Direct Telephone Calls to: (name and telephone number)

(202)293-7060

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国籍	Citizenship Japanese		
郵便の宛先	Post office address c/o NEC Corporation, 7-1, Shiba 5-chome,		
	Minato-ku, Tokyo, Japan		
第二の共同発明者の氏名 (該当する場合)	Full name of second joint inventor, if any		
同第二発明者の署名	日付	Second inventor's signature	Date
住所	Residence		
国籍	Citizenship		
郵便の宛先	Post office address		

(第三又はそれ以降の共同発明者に対しても同様な情報  
および署名を提供すること。)

(Supply similar information and signature for third and  
subsequent joint inventors.)